EFFECTIVENESS OF CLING WRAP UPON HYPOTHERMIA IN NEWBORNS

By

JANE AMIRTHA SANJEEVI

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

APRIL 2013

EFFECTIVENESS OF CLING WRAP UPON HYPOTHERMIA IN NEWBORNS

Approved by the Dissertation Committee on : _____

Research Guide : _____

Dr. Latha Venkatesan
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Principal cum Professor in Nursing,
Apollo College of Nursing,
Chennai- 600 095

Clinical Guide : _____

Mrs.CeciliaMary.S, **M.Sc(N),**
Lecturer,
Apollo College of Nursing,
Chennai-600 095.

Medical Guide : _____

Dr.Radha Lakshmi Senthil.
MBBS., MD, DNB., MRCPCH,
Consultant Neonatologist
Apollo Children's Hospital,
Chennai- 600 006.

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

APRIL 2013

DECLARATION

I hereby declare that the present dissertation entitled "**Effectiveness of cling wrap upon hypothermia in newborns**" is the outcome of the original research work undertaken and carried out by me under the guidance of **Dr.Latha Venkatesan M.Sc.,(N).,M.Phil(N).,Ph.D.(N).,** Principal, Apollo College of Nursing and **Mrs.CeciliaMary.S., M.Sc., (N).,**Lecturer, Apollo College of Nursing, Chennai. I also declare that the material of this has not formed in any way, the basis for the award of any degree or diploma in this University or any other Universities.

M.Sc., (N) II Year

ACKNOWLEDGEMENT

I thank **God Almighty** for being with me and guiding me throughout my endeavour and showering His immense blessings in each and every step to complete the dissertation.

I proudly express my sincere gratitude **to Dr. Latha Venkatesan M.Sc (N), M.Phil(N), Ph.D (N).**, Principal, Apollo College of Nursing for her relentless efforts in setting higher goals for us to achieve and her excellent guidance, caring spirit, support and valuable suggestions during the course which paved way for our overall development.

I extend my earnest gratitude to **Prof. Lizy Sonia, A., M.Sc (N),Ph.D.** Vice-principal and Head of the Medical Surgical Nursing Department, Apollo College of Nursing, for her direction, encouragement and timely help.

My heartfelt thanks to My Research Guide, **Mrs.Cecilia Mary.S**, **M.Sc (N),** Lecturer, Child Health Nursing Department for her continued efforts, motivation and remarkable suggestions towards the completion of this study.

My bouquet of thanks to**Dr.Radhalaksmi Senthil, MBBS,MD,DNB, MRCPCH,** Consultant Neonatologist, Apollo Children's Hospital ,Chennai for her valuable suggestions and guidance.

My sincere thanks to **Prof. K. Vijayalakshmi, M.Sc (N), M.A. Psychology,** Research Co-ordinator, Apollo College of Nursing, for her increasing search, valuable suggestions, efficient guidance, invaluable caring spirit and profound support throughout the study.

My profound gratitude to **Prof. Nesa Sathya Satchi, M.Sc (N).,** Head Of The Department of Pediatric Nursing, for her splendid encouragement and guidance and the successful completion is credited to her.

I would like to specially thank **Mrs.JamunaRani,Msc(N),**Reader, **Mrs.Jenifer.S., Msc(N),** Lecturer, Department of Child Health Nursing, for their guidance and profound support throughout the study.

My sincere thanks to, **Dr.Satish Babu, Neonatologist,** Fortis Malar Hospital Chennai, for permitting me to utilize all the facilities in the research setting. Their good nature, kind heartedness and contagious energy will always be remembered. I also wish to thank all the participants of the study.

A note of thanks to the **Librarians** at Apollo College of Nursing and Dr. Tamilnadu M.G.R.Medical University, and to **Mr.Murugan, Biostatistician** for his constructive effort in clarification and guidance in statistical analysis.

I am grateful to the experts for validating the tools used in this study and I would also like to extend my thankfulness to all the faculty of Apollo College of Nursing for their suggestions and encouragement throughout the study.

I'm indebted to my **Parents, Mr.Sanjeevi , Mrs.Jessie Sanjeevi** and **my sister Jennie Sanjeevi** for their sacrifices, prayers, love and blessings.

I thank my **classmates** for being available for their help whenever I needed them. I thank all those who have supported me in prayer and those who have helped me even in a small way to successfully complete this study.

SYNOPSIS

An Experimental Study to Assess the Effectiveness of Cling Wrap upon Hypothermia in Newborns in Neonatal Intensive Care Unit at Selected Hospitals, Chennai.

The Objectives of the Study were,

1. To assess the level of hypothermia before and after use of cling wrap in control and experimental group of newborns.
2. To determine the effectiveness of cling wrap, by comparing the level of hypothermia, before and after the use of cling wrap in control and experimental group of newborns.
3. To determine the care givers level of satisfaction, regarding use of cling wrap in experimental group of newborns.
4. To find out the association between selected neonatal variables and the level of hypothermia before and after the use of cling wrap in control and experimental group of newborns.

The conceptual framework for this study was developed on the basis of Roy's Adaptation Model which was modified for the present study. The study variables were hypothermia and cling wrap. An extensive review of literature and guidance by experts formed the foundation to the development of neonatal variables proforma, temperature observation record sheet and rating scale on the care giver's level of satisfaction about cling wrap.

An experimental design was adopted for this study. The present study was conducted in Fortis Malar Hospital, Chennai. A sample size of 60 who met the

inclusion criteria were chosen, in that 30 were assigned to control group and 30 to experimental group through systematic random sampling.

The data collection tools were validated and the reliability was established through test-retest and split half technique. The researcher used validated tool for collecting data. After the pilot study, the data for the main study was collected using neonatal variable proforma, temperature observation record sheet to assess the level of hypothermia and caregiver's satisfaction rating scale on the level of satisfaction about Cling wrap. The main data collection was done after determining the feasibility and practicability through pilot study.

Cling wrap is one of the physiological interventions that involve use of a thin polyethylene sheet used to cover over the bassinet from below the neck till the foot end of a neonate to prevent hypothermia and is changed over a period of six hours or whenever the integrity of the cling wrap is lost. Effectiveness of using cling wrap was measured based on the maintenance of temperature at 36.5-37.5 degree celsius in neonates. Newborn's temperature was measured by checking the axillary temperature using mercury thermometer once in every four hours for three consecutive days. Cling wrap was administered only to the experimental group. The level of satisfaction on administration of cling wrap was assessed by using the caregiver's satisfaction rating scale for the experimental group of newborns. Then the collected data was tabulated and analyzed using descriptive and inferential statistics.

Major Findings of the Study were

- Majority of newborns had gestational age of 34-40 weeks (46.7%,53.3%), were males(50, 56.7%) , with an APGAR between 8-10 (63.3%,80%), and birth weight of 2.5-3.5 kg (50%, 66.7%), in control and experimental group respectively.

- Majority of newborns in the experimental group had moderate hypothermia (86.7%) before use of cling wrap whereas after the use of cling wrap there was no hypothermia in the experimental group (100%). Therefore it is attributed to the effectiveness of cling wrap.

- The difference in mean and standard deviation of the level of hypothermia before the use of cling wrap (M=33.84, 33.84 & SD=1.97, 1.53) between the control and experimental groups is not statistically significant ($p<0.001$), whereas after the use of cling wrap, there is a difference in the mean and standard deviation of the level of hypothermia (M=34.26, 36.59 & SD=1.63, 0.145) between the control and experimental groups of newborns. So the null hypothesis Ho_1 was rejected.

- Majority of the caregivers were highly satisfied (87%) with use of cling wrap. This shows that the use of cling wrap was highly effective in reducing hypothermia among newborns in NICU.

- There was significant association between neonatal variables such as gestational age (χ^2=12.94,15.39, df=2) ($p<0.05$), APGAR (χ^2=17.74,23.07, df=2) ($p<0.01$) and pretest level of hypothermia in control and experimental group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR.

- There was significant association between neonatal variables such as gestational age (χ^2=4.04, df=2) ($p<0.05$), APGAR (χ^2=12.9, df=2) ($p<0.01$) and posttest level of hypothermia in control group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR. Whereas there was no association between neonatal variables and posttest level of hypothermia in experimental group of newborns.

Recommendations

- Future study with larger sample size and a matched control will help in reducing the bias.
- A similar study can be conducted in other settings such as community centres and peripheral hospitals.
- A study involving newborns less than 30 weeks will be useful to standardise medical practice in developing countries.
- A comparitive study can be conducted on effectiveness of cling wrap with other thermoregulation therapies upon thermal balances.
- A study can be conducted to assess the level of knowledge among nurses regarding thermal balance.

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APPENDIX – I

LETTER SEEKING PERMISSION TO CONDUCT STUDY

Apollo College of Nursing

(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/0225/12 8.06.12

To,

The Director,
Fortis Malar Hospital,
62, 1st Main road,
Gandhi Nagar,
Adyar,
Chennai-600 020.

Respected Sir / Madam,

Sub.: To request permission for research study – Reg.

Greetings! As part of the curriculum requirement our 2nd year M. Sc. (N) student

Ms.Jane Amirtha Sanjeevi has selected the following title for her research study.

"An experimental study to assess the effectiveness of cling wrap upon hypothermia in preterm neonates at selected hospital, Chennai."

So I kindly request your goodselves to permit her to conduct study in your esteemed institution.

Thanking You,

Dr. LATHA VENKATESAN
PRINCIPAL

APPENDIX - II

LETTER PERMITTING TO CONDUCT STUDY

Apollo College of Nursing
(Recognised by the Indian Nursing Council and Affiliated to the Tamil Nadu Dr. M.G.R. Medical University, Chennai)

CO/0225/12 8.06.12

To,

The Director,
Fortis Malar Hospital,
52, 1st Main road,
Gandhi Nagar,
Adyar,
Chennai-600 020.

Respected Sir / Madam,

Sub.: To request permission for research study – Reg.

Greetings! As part of the curriculum requirement our 2nd year M. Sc. (N) student **Ms.Jane Amirtha Sanjeevi** has selected the following title for her research study.

"An experimental study to assess the effectiveness of cling wrap upon hypothermia in preterm neonates at selected hospital, Chennai."

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Thanking You,

Dr. LATHA VENKATESAN
PRINCIPAL

IS/ISO 9001:2000
Vanagaram to Ambattur Main Road, Ayanambakkam, Chennai - 600 095.
Ph. : 044 - 2653 4387 Tele fax : 044 - 2653 4923 / 044- 2653 4386

APPENDIX - III

ETHICAL COMMITTEE CLEARANCE LETTER

Ethics Committee

Apollo HOSPITALS
TOUCHING LIVES

30th August 2012

To,

Ms. Jane Amirtha Sanjeevi
2nd Year M.SC (Nursing),
Department of Child Health Nursing,
Apollo College of Nursing,
Chennai.

Ref: An experimental study to assess the effectiveness of cling wrap upon hypothermia in newborns at selected hospital, Chennai

Sub: Approval of the above referenced project and its related documents.

Dear Ms. Jane Amirtha Sanjeevi,

Ethics Committee-Apollo Hospitals has received the following document submitted by you related to the conduct of the above-referenced study.

- Project proposal.
- Participant consent form.

The Ethics Committee-Apollo Hospitals reviewed and discussed the study proposal documents submitted by you related to the conduct of the above referenced study at its meeting held on 29th August 2012.

The following Ethics Committee Members were present at the meeting held on 29th August 2012.

Name	Profession	Position in the committee
Mr. S. S. Narayanan	Ethicist	Chairman
Dr. Rema Menon	Clinician	Member Secretary
Dr. Radha Rajagopalan	Clinician	EC-Member
Dr. Krishnakumar	Clinician	EC-Member
Dr. Vijaya Kumar	Clinician	EC-Member
Dr. Clive Fernandes	Consultant Clinical Pharmacologist	Basic Medical Scientist

Apollo Hospitals Enterprise Limited
21, Greams Lane, Off Greams Road, Chennai - 600 006
Tel : 91 - 44 - 2829 3333 Extn : 6008, 91 - 44 - 2829 5465 Extn : 6639 Fax : 91 - 44 - 2829 4449
E - Mail : ecapollochennai@gmail.com

Dr. Nalini Roa	Social Worker	EC-Member
Ms. N. Suseela	Retired English Teacher	Layperson
Ms. Maimoona Badsha	Lawyer	Lawyer
Dr. Paul Dilipkumar	Clinician	EC-Member
Dr. V. Balaji	Clinician	EC-Member
Dr. M. A. Raja	Consultant Medical Oncologist	EC-Member

After due ethical and scientific consideration, the Ethics Committee has approved the above presentation submitted by you.

The EC review and approval of the report is only to meet their academic requirement and will not amount to any approval of their conclusions / recommendations as conclusive, deserving adoption and implementation, in any form, in any healthcare institution.

The Ethics Committee is constituted and works as per ICH-GCP, ICMR and revised Schedule Y guidelines.

With Regards,

Date: 30/8/12

Rema Menon

Dr. Rema Menon,
Ethics Committee-Member Secretary,
Apollo Hospitals, Chennai,
Tamil Nadu, India.

Dr. REMA MENON
MEMBER SECRETARY
ETHICS COMMITTEE APOLLO HOSPITALS
APOLLO HOSPITALS ENTERPRISE LIMITED
CHENNAI-600 006, TAMILNADU

APPENDIX - IV

PLAGIARISM ORIGINALITY REPORT

Plagiarism Detector - Originality Report

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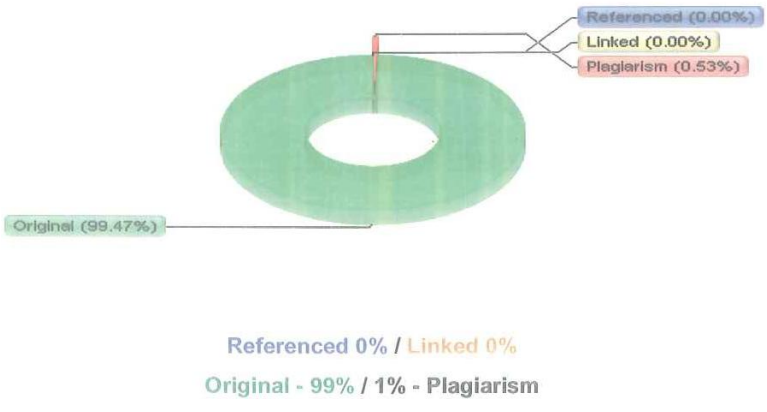

APPENDIX – V

REQUEST FOR CONTENT VALIDITY

LETTER REQUESTING OPINIONS AND SUGGESTIONS OF EXPERTS FOR ESTABLISHING CONTENT VALIDITY OF RESEARCH

From

Ms. Jane Amirtha Sanjeevi,
M.Sc., (Nursing) II Year,
Apollo College of Nursing,
Chennai-95.

To

Through Proper channel
Dr. Latha Venkatesan,
Principal,
Apollo College of Nursing.

Sub: Request for opinions and suggestions of experts for content validity of Research tool.

Respected Sir/ Madam

Greetings! As a part of the Curriculum Requirement the following research title is selected for the study.

"An Experimental Study to Assess the Effectiveness of Cling Wrap upon Hypothermia in Newborns in Neonatal Intensive Care Unit at selected hospital, Chennai".

I will be highly privileged to have your valuable suggestions with regard to the establishment of Content Validity of Research tool. So, I request you to validate my Research tool and give suggestions about the tool.

Thanking You,

Yours Sincerely,

(Ms. Jane Amirtha Sanjeevi)

APPENDIX – VI

CONTENT VALIDITY CERTIFICATE

I hereby certify that I have validated the research tool and interventional programme of Ms.Jane Amirtha Sanjeevi, M.Sc (Nursing) II year student who is undertaking research study on **"An Experimental Study to Assess the Effectiveness of Cling Wrap upon Hypothermia in Newborns in Neonatal Intensive Care Unit at selected hospital, Chennai".**

Signature of Expert

Name and designation

APPENDIX - VII

LIST OF EXPERTS FOR CONTENT VALIDITY

1. **Dr. Latha Venkatesan, M.Sc (N)., M.Phil., Ph.D.,**
   Principal cum Professor,
   Apollo college of Nursing,
   Chennai-95.

2. **Dr.Radhalakshmi Senthil, MBBS, MD, DNB, MRCPCH**
   Consultant Neonatologist,
   Apollo Children's Hospital,
   Chennai.

3. **Prof. Lizy Sonia, A., M.Sc. (N), Ph.D**
   Vice Principal & Professor in Nursing,
   HOD of Medical Surgical Nursing,
   Apollo College of Nursing,
   Chennai-95.

4. **Prof. K.Vijayalakshmi,M.Sc.(N), M.A.Psychology, Ph.D,**
   HOD Dept. of Mental Health Nursing,
   Apollo College of Nursing,
   Chennai-95.

5. **Prof.Nesa Sathya Satchi,M.Sc(N)**
   HOD, Dept .of Child Health Nursing,
   Apollo College of Nursing,
   Chennai-95.

6. **Prof.G. Shobana, M.Sc(N),Ph.D.,**
HOD, Dept. of Community Health Nursing,
Apollo College of Nursing,
Chennai-95.

7. **Mrs. Stella Mary,I.,M.Sc.(N),**
Reader, Dept. of Mental Health Nursing,
Apollo College of Nursing,
Chennai-95.

APPENDIX - VIII

RESEARCH PARTICIPANT CONSENT FORM

Dear Participant,

I am a M.Sc., Nursing student of Apollo College of Nursing, Chennai. As a part of my study, a research on **"An Experimental Study to Assess the Effectiveness of Cling Wrap upon Hypothermia in Newborns in Neonatal Intensive Care Unit at selected hospital, Chennai".** is selected to be conducted. The findings of the study will be helpful in controlling hypothermia in newborns.

I hereby seek your consent and co-operation to participate your child in the study. Please be frank and honest in your responses. The information collected will be kept confidential and anonymity will be maintained.

Signature of the researcher

I ……. hereby consent to participate my child in the study.

Place:

Date: Signature of the Parent

APPENDIX -IX

CERTIFICATE FOR ENGLISH EDITING

To whomsoever it may concern

This is to certify that the dissertation title **"Effectiveness of Cling Wrap upon hypothermia in newborns at a selected hospital, Chennai"** by Ms. Jane Amirtha Sanjeevi, II year M.Sc. Nursing student of Apollo College of Nursing, Chennai was edited for English language appropriateness.

CHRISTINA TAKKALSOROJINI J
M.A., M.Phil.,
ASST. PROFESSOR
DEPARTMENT OF ENGLISH
VOORHEES COLLEGE
VELLORE-632001

APPENDIX - X

NEONATAL VARIABLES PROFORMA OF NEWBORNS IN NICU

Purpose

This proforma is used to measure the demographic variables of neonate such as gestational age in weeks at birth, birth weight, gender, APGAR, Birth order.

Instructions

The investigator will collect the information through referring the records. The information gathered will be utilized thoroughly for the purpose of research and will be held confidential.

Sample no:

1. Gestational age of neonate in weeks

1.1 30- 33 ☐

1.2 34- 37 ☐

1.3 37- 40 ☐

2. Birth weight of the neonate in Kg

2.1 1-2.5 ☐

2.2 2.5-3.5 ☐

2.3 >3.5 ☐

3. Gender

3.1 Male ☐

3.2 Female ☐

4. APGAR score at 10th minute

4.1 <3 ☐

4.2 4-7 ☐

4.3 8-10 ☐

APPENDIX XI

TEMPERATURE OBSERVATION RECORD SHEET

Purpose

This observation sheet is used to measure Temperature.

Instruction

The investigator will collect information by observing using an appropriate apparatus.

Day	Temperature readings						
	Pretest	**8am**	**12 Noon**	**4pm**	**8pm**	**12am**	**4am**
1							
2							
3							

Temperature grading:

<32.2 or 32.2-34.2 degree C – Severe Hypothermia

34.3- 36.0 – Moderate hypothermia

36.1- 36.8- No Hypothermia

> 36.8- Hyperthermia

BLUE PRINT FOR RATING SCALE TO ASSESS THE LEVEL OF CAREGIVER'S SATISFACTION IN EXPERIMENTAL GROUP

Sl.No	Content	Item no	Total item	Percentage
1	Characteristics of the researcher	1,2,3,4,5	5	50%
2	Effectiveness of cling wrap	6,7,8,9,10	5	50%
TOTAL			10	100

Scoring Interpretations

Score	**Percentage**	**Interpretation**
<15	30%	Satisfied
15-35	>30-70%	Moderately satisfied
>35	>70%	Highly satisfied

APPENDIX-XII

RATING SCALE TO ASSESS THE CAREGIVER'S LEVEL OF SATISFACTION

Purpose

This rating scale is designed to assess the caregiver's level of satisfaction regarding use of cling wrap in experimental group of newborns.

Instruction

There are 10 items given below. Kindly go through and give the response. Feel free to answer. The answers will be kept confidential. Please put a tick (✓) in the following:

SI no	Statement	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
1	The researcher clearly explained about the intervention					
2	I am satisfied with the manner of information disclosure					
3	The researcher cleared all doubts about the intervention					
4	The researcher was present throughout the intervention					
5	I have trust in the personal approach of the researcher					

SI no	Statement	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
6	Cling wrap effectively maintained temperature of the pre term neonate					
7	Cling wrap effectively maintains bio physiological parameters of preterm neonate					
8	It does not affect any clinical procedure on the pre term neonate					
9	It is cost effective					
10	It is easy to practice					

Scoring key

Strongly agree	-	5
Agree	-	4
Uncertain	-	3
Disagree	-	2
Strongly disagree	-	1

Interpretations

Score	Percentage	Interpretation
<15	30%	Satisfied
15-35	>30-70%	Moderately satisfied
>35	>70%	Highly satisfied

APPENDIX XIII

ITEM WISE FREQUENCY AND PERCENTAGE DISTRIBUTION OF CARE GIVERS LEVEL OF SATISFACTION REGARDING USE OF CLING WRAP IN EXPERIMENTAL GROUP OF NEWBORNS

(N=30)

Items	Strongly agree		Agree		Disagree		Strongly disagree	
	n	p	n	p	n	p	n	p
The researcher clearly explained about the intervention	29	96.7	1	3.3	-	-	-	-
I am satisfied with the manner of information disclosure	28	93.3	2	6.7	-	-	-	-
The researcher cleared all doubts about the intervention	28	93.3	2	6.7	-	-	-	-
The researcher was present throughout the intervention	26	86.7	4	13.3	-	-	-	-
I have trust in the personal approach of the researcher	26	86.7	4	13.3	-	-	-	-
Cling wrap effectively maintained temperature of the pre term neonate	24	80	6	20	-	-	-	-
Cling wrap effectively maintains bio physiological parameters of preterm neonate	21	70	9	30	-	-	-	-
It does not affect any clinical procedure on the pre term neonate	25	83.3	15	16.7	-	-	-	-
It is cost effective	29	96.7	1	3.3	-	-	-	-
It is easy to practice	28	93.3	2	6.7	-	-	-	-

APPENDIX - XIV

DATA CODE SHEET

NEONATAL VARIABLE PROFORMA

GA Gestational age of neonate in weeks

1.1 30-33

1.2 34-37

1.3 37-40

B.WT Birth weight of the neonate in Kg

2.1 1-2.5 kg

2.2 2.5-3.5kg

2.3 >3.5 kg

GEN Gender

3.1 Male

3.2 Female

APG APGAR score at birth

4.1 <3

4.2 4-7

4.3 8-10

MT Mean Temperature

APPENDIX – XV

MASTER CODE SHEET

SI NO	CONTROL					EXPERIMENT				
	GA	B.WT	GEN	APG	MT	GA	B.WT	GEN	APG	MT
1	1.3	2.3	3.2	4.2	33.86	1.3	2.3	3.1	4.2	36.7
2	1.1	2.2	3.2	4.3	33.3	1.2	2.2	3.1	4.3	36.7
3	1.2	2.1	3.1	4.2	31.8	1.2	2.1	3.1	4.3	36.8
4	1.3	2.2	3.1	4.3	31.9	1.3	2.2	3.1	4.3	36.4
5	1.3	2.3	3.1	4.3	33.8	1.2	2.3	3.2	4.3	36.7
6	1.3	2.2	3.1	4.2	36.7	1.1	2.2	3.1	4.2	36.8
7	1.1	2.1	3.2	4.3	36.8	1.2	2.1	3.1	4.3	36.7
8	1.2	2.3	3.1	4.3	33.8	1.2	2.2	3.2	4.3	36.8
9	1.3	2.2	3.1	4.2	32.7	1.3	2.2	3.1	4.3	36.3
10	1.2	2.2	3.2	4.3	33.9	1.2	2.2	3.2	4.3	36.5
11	1.3	2.1	3.1	4.1	32.7	1.1	2.2	3.2	4.3	36.7
12	1.1	2.2	3.2	4.3	33.9	1.2	2.3	3.1	4.1	36.7
13	1.2	2.3	3.1	4.2	32.3	1.2	2.2	3.2	4.3	36.5
14	1.3	2.2	3.2	4.3	33.9	1.3	2.2	3.1	4.3	36.6
15	1.2	2.1	3.1	4.3	32.4	1.2	2.1	3.2	4.3	36.4
16	1.3	2.2	3.2	4.2	33.8	1.3	2.2	3.2	4.3	38.6
17	1.2	2.2	3.2	4.3	34.5	1.2	2.2	3.1	4.3	36.6
18	1.3	2.2	3.1	4.3	36.8	1.1	2.2	3.2	4.3	36.7
19	1.1	2.1	3.2	4.2	36.9	1.3	2.2	3.2	4.2	36.6
20	1.3	2.2	3.1	4.3	36.7	1.2	2.3	3.1	4.3	36.4
21	1.2	2.3	3.2	4.3	34.5	1.3	2.2	3.1	4.3	36.7
22	1.3	2.2	3.1	4.3	32.6	1.2	2.1	3.2	4.3	36.8
23	1.3	2.1	3.2	4.1	32.5	1.1	2.2	3.1	4.3	36.7
24	1.1	2.2	3.1	4.3	34.2	1.3	2.2	3.1	4.3	36.5
25	1.2	2.2	3.2	4.3	34.0	1.2	2.2	3.1	4.2	36.5
26	1.3	2.1	3.2	4.3	34.7	1.3	2.2	3.2	4.3	36.6
27	1.3	2.2	3.1	4.2	36.8	1.2	2.3	3.1	4.3	36.5
28	1.2	2.1	3.1	4.3	34.2	1.2	2.2	3.2	4.3	36.4
29	1.2	2.3	3.2	4.3	35.0	1.3	2.2	3.2	4.3	36.7
30	1.1	2.1	3.2	4.2	36.9	1.2	2.3	3.1	4.2	36.5

APPENDIX – XVI

PHOTOGRAPHS DURING CLING WRAP ADMINISTRATION

CHAPTER -I

INTRODUCTION

Background of the Study

"As a mother my job is to take care of what is possible and trust God with the impossible."

-Ruth Bell Graham

A new addition into a family has always been a joyous event in any community across the globe. The long awaited experience of birthing adds inexplicable joy to motherhood and in turn the entire family. Newborns become the center of attraction at any given point of time. Today's healthy newborn is tomorrow's healthy as well as wealthy citizen of the country. Hence neonatal health and well being is a prudent factor to decide upon the future health status of the nation. This rings the alarm to escalate neonatal care to greater standards.

According to the WHO report of 2011, nearly 99% of all neonatal deaths occur in low- and middle-income countries. Neonatal mortality has been declining worldwide. The number of deaths among babies 0-28 days of life decreased from 4.4 million in 1990 to 3.1 million in 2010. Deaths that occur among babies less than 28 days of life (neonatal period) account for about 40% of all under-five deaths. As many as 70 percent of neonatal deaths could be prevented with known, simple, non-intensive interventions: basic resuscitation, management of low birth weight and treatment of sepsis.

Yet such low-cost, proven treatments remain difficult to implement in resource-poor settings, a reality that speaks to the pressing need for professionals with an interest in reducing global health disparities. Problems in newborns include thermoregulation, adaptation issues to extra-uterine life, jaundice, feeding problems, birth injuries and defects to minor issues like colic, rash, fever etc out of which hypothermia constitutes as a major issue amongst all newborns. According to the

WHO report of 2011, 27% of the causes of infant mortality due to preterm delivery and hypothermia contribute about 18-42% of infant mortality worldwide, 20-35% in India and about 8-15% in Tamil Nadu.

Thermoregulation is a critical component of neonatal care because it has been well documented that hypothermia is a major contributor to infant mortality. Maintaining a neutral thermal environment for premature and very low birth weight infants can have a significant impact on health outcomes and has been recognized behind size, as perhaps the earliest distinguishable characteristic when compared to the full term neonate. Newly born infants undergo a series of biological adjustments in order to adapt to their new environmental conditions. One of the physiological issues is the failure of the neonate to accommodate to the surrounding thermal environment resulting in hypothermia.

Adaptation to extrauterine life involves the newborn infant in a series of biological adjustments to a totally new environment, particularly when the ambient temperature is cold. The primary source of heat production for the neonate is through non-shivering thermogenesis (oxidation of brown fat), which is the production of heat by metabolism. The posterior hypothalamus responds to cold stress with the release of norepinephrine, which triggers the production of glucose needed for thermogenesis in brown fat.

Brown fat, a thermogenic organ unique to the neonate is deposited after 28 weeks gestation in adipose tissue around the scapula, kidneys, adrenals, neck and axilla. Neonatal hypothermia on admission remains a major problem in our population. There is need to increase awareness among nursing staff and mothers about the serious consequences of hypothermia in newborns.

Thermoregulatory needs of the newborn play a vital role in neonatal care, particularly in first several hours of life. The infants are at risk for hypothermia in the first days to weeks of life, due to evaporative, convective and radiant heat losses during resuscitation. Evaporative and convective heat loss depends on air speed and

humidity of the air. Newborns can become hypothermic (subnormal body temperature) very soon after birth, even in the summer.

Neonatal hypothermia is associated with an increased mortality risk for 28 days. There are few hospital-based data on specific risk factors for neonatal hypothermia and is well recognized as a factor influencing newborn health. The newborn infant exhibits immature thermoregulation as compared with the older child or adult and therefore needs to be protected from extremes of cold and heat. World Health Organization (WHO) provided the following definitions of normothermia 36.5–37.5 °C and hypothermia as 32.0–36.0°C

Preventive measures of hypothermia range from simple efforts of delaying the first baby bath, mummification, co-bedding and initiating kangroo mother care in case of premature infants etc. For newborns who are ill or under close monitoring in NICU, hypothermia is combated through use of radiant warmers, mummification, use of head caps, mittens and socks and also increasing the ambient room temperature.

Cling wrap is an innovative newer technique employed to control hypothermia of newborns in NICU. It is a simple and effective mode that is utilized to maintain normothermia by principle of radiation and convection. It conserves the body heat and retains the ambient external source of heat supplied, as well as preventing the insensible water loss from the newborns. As it is readily available and affordable, requiring minimal efforts in administration along with broad spectrum of benefits in maintaining thermoregulation, it is therefore the most sought after convenient modality for thermal balance in newborns even in primitive settings.

Need for the Study

Newborn baby is a homeothermic but his ability to stay warm may easily be overwhelmed by extremes of environmental temperatures. Neonatal hypothermia is often due to lack of attention by health care providers and continues to be a very important cause of neonatal deaths.

Of all early neonatal deaths (deaths within the first 7 days of life) that are not related to congenital malformations, 28% are due to hypothermia. Hypothermia have been reported to range from 5% to 7% of live births in some developed countries, but are estimated to be substantially higher in developing countries. According to the WHO report of 2011, 27% of the causes of infant mortality is due to preterm delivery and hypothermia contributes about 18-42% of infant mortality worldwide. Approximately 20-35% of neonatal mortality in India is due to hypothermia alone and nearly 8-15% of neonatal deaths in Tamil Nadu is chiefly due to hypothermia and poor neonatal care.

The adverse effect of hypothermia on the viability and survival in premature and low birth weight neonates has been well reported. Low body temperature in newborns can lead to an increased rate of basal metabolism, peripheral vasoconstriction, decreased peripheral perfusion, tissue ischemia and finally metabolic acidosis .Vascular changes in the lungs may result in decreased ventilation, increased demand for oxygen and worsening of respiratory distress. Meanwhile, acidosis and hypoxia can predispose to pulmonary hemorrhage and disseminated intravascular coagulation (DIC). Hepatocyte ischemia affects liver function and may cause indirect hyperbilirubinemia. In addition, the high metabolic rate leads to higher glucose consumption and hypoglycemia.

Considering the high prevalence of hypothermia experienced by neonates born in developing countries, including full term infants, the associated complications being of larger magnitude and the information related to this topic is scattered, the researcher decided to study the effectiveness of hypothermia control in newborns. There is a general agreement that perinatal hypothermia should be

avoided in all newborns, with the possible exception of those who have sustained a significant hypoxic-ischemic insult. In 2006, the American Academy of Pediatrics' and American Heart Association's Neonatal Resuscitation Program (NRP) textbook recommended, that the goal (the first postnatal temperature) should be an axillary temperature of approximately 36.5 °C. The NRP text also noted that temperature must be monitored closely because of the slight but described risk of hyperthermia (which) during or after ischemia is associated with progression of cerebral injury. The goal is to achieve normothermia and avoid iatrogenic hyperthermia.

Continuous temperature monitoring should be initiated as soon as possible after the birth of the infants in order to document and achieve normothermia. Since low delivery room temperatures can predispose to hypothermia, when delivery of a baby is anticipated, the temperature of the room should be increased, the radiant warmer to be pre-heated by turning it on well before birth, use of head cap, use of pre- warmed linen etc. are essential neonatal care in achieving normothermia.

Prevention of hypothermia is also enhanced by use of warmers with built in weighing scales and appropriate attention to adequate warming mechanisms of transport incubators. However, of paramount importance is staff education in this area on the problem of neonatal hypothermia and the use of preventive strategies, especially in the extremely low birth weight infant. However, in low-resource settings, adequate thermal care of newborns is difficult to achieve, hence incorporation of simple, cost effective and outcome oriented measures need to be sensitized to address neonatal hypothermia even in such primitive settings.

In an attempt to prevent neonatal hypothermia in infants, NICU’s which are air conditioned have come forward to place cling wrap over the lower two-thirds of the upper edge of their bassinets. Unlike infant incubators, a piece of cling wrap costs very little, is easy to apply, allows ease of nursing and is readily disposable after use or when soiled. It is speculated that the cling wrap so placed may decrease heat loss due to radiation and convection and thereby preventing insensible water loss as well.

Jenifer (2010) Health Care Reports, demonstrate that a polyethylene thermal wrap (plastic wrap) prevented a fall in the newborn's temperatures in the immediate newborn period particularly for the infants born less than 28 weeks of gestation. The above article shows that cling wrap has been claimed to maintain the newborn's temperature and aid in the prevention of hypothermia. As the magnitude of the growing problem is large, it is wiser to employ effective measures that require minimal efforts in combating the pressing need. Thus prevention of hypothermia using thermoregulation therapies such as cling wrap is very essential to prevent the complications in the newborn.

As discussed earlier, since most of the neonatal deaths are due to preventable causes, the researcher decided to study upon one such preventable cause-hypothermia using a cost effective intervention and thereby promoting benefits of utilization among health professionals. Initiation of such simpler interventions to control major health care problem will speak tons of miracle stories even in primitive health care settings. Thus, re-direction of nursing care involving continued efforts in promotion, prevention and curative aspects of newborn care is the need of the golden hour.

Statement of the Problem

An Experimental Study to Assess the Effectiveness of Cling Wrap upon Hypothermia in Newborns in Neonatal Intensive Care Unit at Selected Hospital, Chennai.

Objectives of the Study

1. To assess the level of hypothermia before and after use of cling wrap in control and experimental group of newborns.
2. To determine the effectiveness of cling wrap, by comparing the level of hypothermia, before and after the use of cling wrap in control and experimental group of newborns.

3. To determine the care givers level of satisfaction, regarding use of cling wrap in experimental group of newborns.

4. To find out the association between selected neonatal variables and the level of hypothermia before and after the use of cling wrap in control and experimental group of newborns.

Operational Definitions

Effectiveness

In this study, effectiveness refers to the outcome of using cling wrap, with regard to maintenance of temperature at 36.5-37.5 degree Celsius in newborns. This is measured by checking the axillary temperature using mercury thermometer once in every four hours.

Cling wrap

In this study, cling wrap refers to a thin polyethylene sheet used to cover over the bassinet from below the neck till the foot end of a newborn to prevent hypothermia and is changed over a period of six hours.

Hypothermia

In this study, hypothermia refers to temperature between 32 -36 degree Celsius in newborns and this is measured by checking the axillary temperature using mercury thermometer once in every four hours.

Newborns

In this study, newborns refer to babies within first 28 days of life.

Neonatal Intensive Care Unit (NICU)

In this study, NICU refers to, specialized care setting with equipments and personnel, providing care for sick newborns under aseptic measures.

Care givers

In this study, care givers refer to parents and nurses involved in direct care of newborns placed in NICU.

Level of satisfaction

In this study, it refers to the feeling of satisfaction achieved by the use of cling wrap among the care givers of the experimental group of newborns and is measured using self developed care giver's satisfaction rating scale.

Assumptions

- Thermoregulation is a vital physiological demand for newborns
- Newborns are prone to hypothermia.
- Cling wrap conserves heat.

Null Hypotheses

Ho_1 There will be no significant difference in the level of hypothermia , before and after use of cling wrap in the control and experimental group of newborns.

Ho_2 There will be no significant association between selected neonatal variables and level of hypothermia, before and after use of cling wrap in the control and experimental group of newborns.

Delimitations

The study was delimited to

- All newborns within 28 days of life
- Newborns admitted in NICU.
- Hemodynamically stable newborns

Conceptual frame work

A framework is a group of concepts and a set of propositions that spell out the relationship between them. Their overall purpose is to make scientific findings meaningful and generalized.

The conceptual framework for a particular study is the abstract logical structure that enables the researcher to link the findings to nursing body of knowledge. It is developed from the existing theory of interest and proposing relationship among them. The model gives the direction for planning research design, data collection and interpretation of findings.

A conceptual framework deals with interested concepts on abstractions that are assembled together in some rationale scheme by virtue of their relevance to a common theme. It is a device that helps to stimulate research that the extension of knowledge by providing both direction and impetus. A framework may serve as a springboard for scientific advancements (Polit and Hungler, 2007).

The conceptual framework of present study is based on modified Callista Roy's adaptation Model (1970)

Roy's adaptation model

Callista Roy's adaptation model (1970)explain that human being are bio-psychological adaptive system, who cope within the environmental change through the process of adaptation. Within the human system there are four sub systems, response modes such as physiological needs, self concept, role function and independence. These sub system constitute adaptive mode that provide mechanism for coping with environmental stimuli and change. The goal of nursing according to this model is to promote adaptation in human being during health and illness.

Main concepts of this model are input, through put, output and feedback. In this study input refers to the neonatal variables such as gestational age, birth weight, gender and APGAR. Throughput refers to providing nursing intervention that is cling wrap application over the lower two-third of the bassinet covering the newborn from below the neck till the foot end of the neonate in the experimental group. The control group is left with the routine hospital measure of neonatal care and the consecutive temperature readings are charted for both the groups every fourth hourly over a period of 24 hours and the procedure is extended for a span of three days.

Output refers to the newborn's thermal balance. These patterns may be observed by measuring the axillary temperature using mercury thermometer. These responses provide feedback for the system. Roy's state that output of the system is either adaptive response or non adaptive responses. Non adaptive response includes moderate to severe hypothermia or hyperthermia. Adaptive response includes maintenance of normothermia.

Feed back for adaptive response enhancement will be given and non adaptive response area reinforcement will be given.

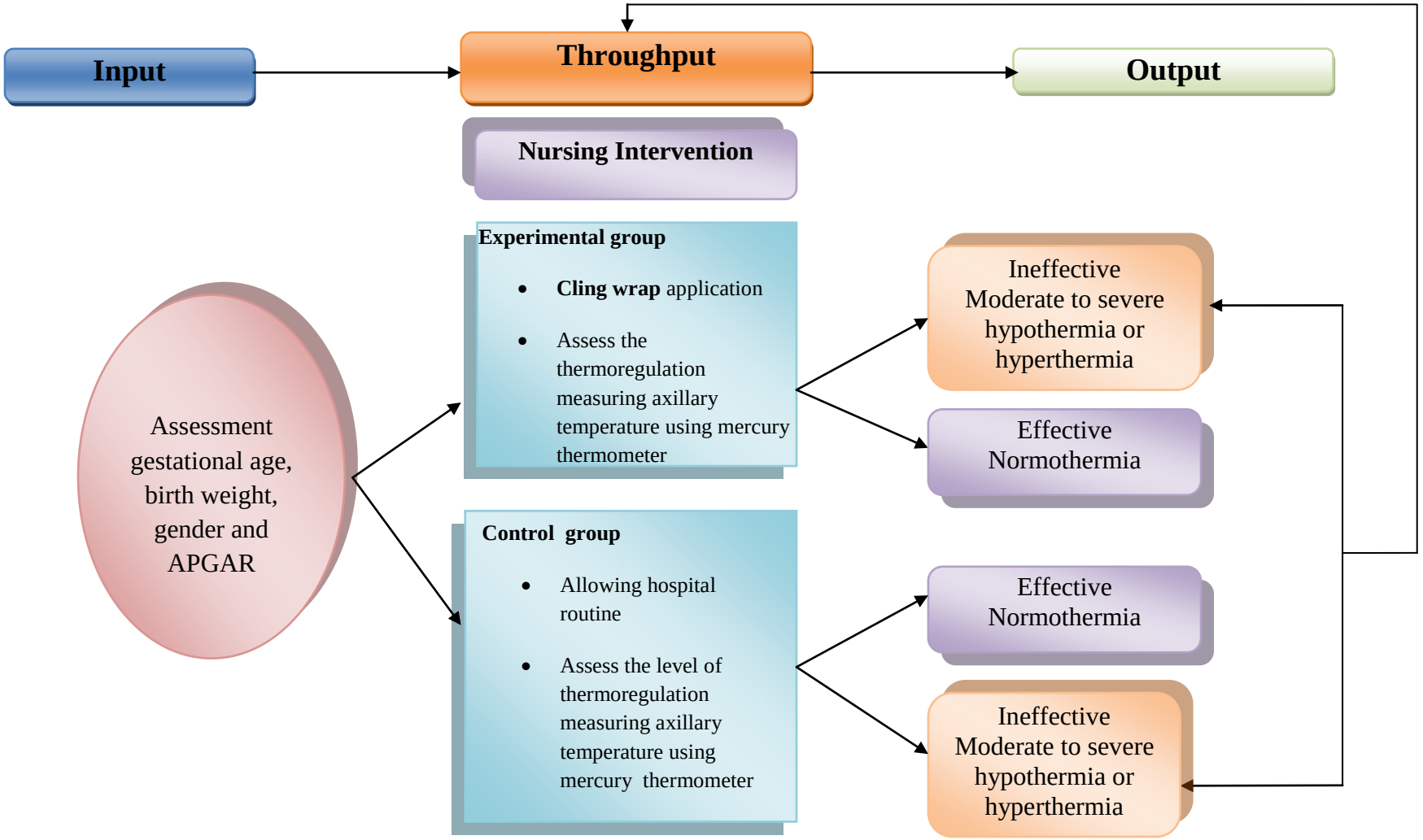

Fig:1 Conceptual Frame Work Based On Modified Roy's Adaption Model (1970)

Projected Outcome

The expected outcome of the study will be that the use of cling wrap will effectively prevent hypothermia in newborns and thereby improve the thermodynamic status of newborn and thereby increasing the caregiver's level of satisfaction.

Summary

This chapter has dealt with the background, need for the study, statement of the problem, objectives, operational definitions, assumptions, null hypotheses, delimitations, projected outcome and conceptual framework of the study.

Organization of the Report

Further aspects of the study are presented in the following five chapters

In Chapter II **:** Review of literature

In Chapter III **:** Research methodology which includes research approach, research design, setting, population, sample, sample size and sampling technique, tool description, content validity, reliability of the tool, pilot study, data collection and problem faced during data collection and plan for data analysis.

In Chapter IV **:** Analysis and interpretation of data.

In Chapter V **:** Discussion

In Chapter VI **:** Summary, conclusion, implications, recommendations

CHAPTER II

REVIEW OF LITERATURE

A literature review is an organized written presentation of what has been published on a topic of scholars (Burns and Groove,2004).This chapter deals with a review of published and unpublished research studies and from related material for the present study. The review helped the researcher to develop an insight into problem area. This helped the researcher in building foundation of study.

The review of literature in this chapter has been discussed under the following headings

- **Literature related to neonatal care**
- **Literature related to hypothermia in newborns.**
- **Literature related to cling wrap.**
- **Literature related to effectiveness of cling wrap upon hypothermia in newborns.**

Literature related to Neonatal Care

A study was conducted by Geraldiv (2009) on successful implementation of evidence-based routines in Ukrainian maternities to describe the process of change and assess compliance and effect on maternal and infant outcome when the WHO package Effective Perinatal Care (EPC) was implemented. Baseline data were collected from 652, 742 and 302 deliveries and 420, 381 and 135 infants, respectively. EPC procedures were successfully implemented and adherence to the protocols was excellent. For most variables, the change occurred during the first three months but was well sustained. The use of partogram increased fourfold in

Donetsk and from 0% to 60% in Lviv. Induction and augmentation of labor decreased to less than 1% and less than 5%, respectively. Cesarean section rate dropped significantly in two of the maternities. The proportion of hypothermic infants decreased from 60% (Donetsk), 85% (Lutsk) and 77% (Lviv) to 1% in all three maternities during the first three months and was stable throughout the study period. Admission to Neonatal Intensive Care Unit decreased significantly in two of the maternities and there was no effect on early neonatal mortality.

Review of Domiciliary Newborn-care Practices in Bangladesh by Gary (2006) implied that high proportions of infant deaths (two-thirds) and deaths among children aged less than five years (38%) occur in the neonatal period. Although most of these deaths occur at home due to preventable causes, little is known about routine domiciliary newborn-care practices and care-seeking for neonatal illness. As an initial step in strategic planning for the implementation of interventions in Bangladesh to improve neonatal outcomes, a review of the literature of antenatal, intra partum, and postpartum care practices for mothers and newborns in Bangladeshi communities and homes was conducted. Hypothermia is not recognized as a separate entity but rather, may be considered a manifestation of sickness in a child. Risk for hypothermia may stem from deeply-rooted traditional beliefs and practices. The newborn typically is placed wet and unattended on the ground until after the placenta is delivered.

Newborn babies are not covered with clothes immediately after delivery, although sometimes they are wrapped with dirty clothes, preferably a lungi (piece of cloth wrapped around the waist) of an uncle or the mother's saree as the next choice. To keep a baby warm, an earthen pot containing coal is heated on a fire, and then placed close to the baby to provide heat, although this is done only sporadically. Relatives rub the newborn with oil and then bathe the baby to make him/her holy (clean), even on cold nights. Among Hindus, babies are bathed after putting turmeric to the body immediately after the delivery. Only after cleaning the mother may the

attendants clean the baby. Vernix caseosa is considered unholy, and attempts are made to remove it. The baby's head is shaved soon after delivery.

In a rural Bangladesh hospital another study was conducted on the introduction of neonatal care. A neonatal care unit was introduced into a rural hospital in Bangladesh. Emphasis was on simple care to prevent hypothermia, hypoglycemia and infection, and involving mothers in caring for their infants as much as possible. The mean birth weight was found to be only 2.44 kg, so that the level of low birth weight requiring special care was fixed at 2.0 kg. At this level, during the first year of operation, 193 low birth weight babies were attended, approximately 20% of total deliveries. Of these, 80% were above 1.5 kg and had a mortality of 25%.

Those below 1.5 kg fared worse, and 83% either died or were discharged against medical advice. The main problems were an initial lack of enthusiasm from the nursing staff, high incidence of sepsis (related to poor hygiene of mothers) and difficulty in persuading mothers to keep very low birth weight babies in hospital. However, with minimal expenditure and equipment, appropriate neonatal care saved the lives of many infants. Establishing breastfeeding and educating mothers reduced the subsequent high mortality of newborns.

Literature related to Hypothermia in Newborns

According to The WHO report of 2011, 27% of the causes of infant mortality due to preterm delivery and hypothermia contribute about 18-42% of infant mortality worldwide. Approximately 20-35% of neonatal mortality in India, is due to hypothermia alone and nearly 8-15% of neonatal deaths in Tamil Nadu is chiefly due to hypothermia and poor neonatal care.

The report also suggests that at birth, the neonate rapidly cools in response to the relatively cold extra uterine environment. Thus, the neonatal temperature rapidly drops soon after birth. In order to survive, the neonate must accelerate heat production via non shivering thermogenesis (NST), which is coupled to lypolysis in brown adipose tissue. Thermogenesis must begin shortly after birth and continue for several hours. Since thermogenesis requires adequate oxygenation, a distressed neonate with hypoxemia cannot produce an adequate amount of heat to increase its temperature. Therefore, increased fetal heat production is essential for survival. The thermogenic response begins within minutes of birth and continues for many hours. For example, oxygen consumption and heat production of the human neonate increases two to three fold during cold stress at birth.

Two heat production modalities have been described namely; the basic heat production as a result of increased cellular metabolic activity and extra-heat production when necessary, such as cold stress. Extra-heat production includes nonshivering and shivering thermogenesis which produces heat by shivering skeletal muscles. Since neonatal muscles are relatively immature to produce heat, shivering thermogenesis is an insignificant factor. The significant role of nonshivering thermogenesis (NST) at birth has been well recognized; heat is produced in brown adipose tissue.

Nippon (2010) conducted an observational study at a tertiary care unit in Uzbekistan among 150 sick neonates in nurseries between June and August. The study reasons that 60% of the sick neonates battled thermoregulation in comparison to the normal neonates. It also infers that hypothermia posses a massive challenge to the sick neonates during treatment of medical or surgical conditions in them.

A prospective observational study of post-delivery care and neonatal body temperature, carried out by Ravinder in Kathmandu Maternity Hospital, which was followed by a randomized controlled intervention study using three simple methods for maintaining body temperature. There were 500 infants in the initial observation

study and 300 in the intervention study. In the observation study, 85% (420/495) of infants had temperatures < 36 degrees C at 2nd hour of birth and nearly 50% (198/405) had temperatures < 36 degrees C at 24 hours of birth. Most of the infants who were cold at 24 hours of birth had initially become cold at the time of delivery (only seven infants had been both well dried and wrapped). In the intervention study, all infants were dried and wrapped before random assignment to one of the three methods: the "kangaroo" method, the traditional "oil massage" or a "plastic swaddler". All three were found to be equally effective. Overall, 38% (114/298) of the infants had temperatures < 36 degree C at 2nd hour of birth and 18% (41/231) at 24 hours of birth when none was < 35 degreeC.

At a referral hospital in Tehran, a study was conducted by Shanawaz to identify the incidence rate and risk factors of neonatal hypothermia. 900 neonates were randomly selected. Body temperature was measured repeatedly at different time points after birth. More than 50% became hypothermic soon after birth. Multiple regression analysis showed that low birth weight, low gestational age, environmental temperature, low Apgar score, multiple pregnancies and receiving cardiopulmonary resuscitation were significantly associated with hypothermia. These findings suggest that there is an urgent need to sensitize and educate all levels of staff dealing with neonates in the country.

Ellis (2012) conducted a study to assess postnatal hypothermia and cold stress among newborn infants in Nepal monitored by continuous ambulatory recording. The aim of the study was to describe the pattern of hypothermia and cold stress after delivery among a normal neonatal population in Nepal, to provide practical advice for improving thermal care in a resource limited maternity hospital. 35 healthy term neonates not requiring special care were enrolled for study within 90 minutes of birth. Continuous ambulatory temperature monitoring, using micro thermistor skin probes for forehead and axilla, a flexible rectal probe, and a black ball probe placed next to the infant for ambient temperature, was carried out.

Twenty four hour mean ambient temperatures were generally lower than the WHO recommended level of 25 degrees C (median 22.3 degrees C, range 15.1-27.5 degrees C). Postnatal hypothermia was prolonged, with axillary core temperatures only reaching 36 degrees C after a mean of 6.4 hours (range 0-21.1; SD 4.6). There was persistent and increasing cold stress over the first 24 hours with the core-skin (axillary-forehead) temperature gap exceeding 3 degrees C for more than half of the first 24 hours. The study concluded that continuous ambulatory recording identifies weak links in the "warm chain" for neonates. The severity and duration of thermal problems was greater than expected even in a hospital setting where some of the WHO recommendations had already been implemented.

Literature related to Cling Wrap

Benjamin (2011) stated in an article that cling wrap is a polyethylene film that conserves heat. Cling wrap hangs on to everything it touches like grim death. It is static cling that keeps the wrap holding tight to everything around it. The plastic acquires a charge and sticks itself to anything with an opposite charge. Many plastic bowls carry a very slight negative charge along their surface, giving the wrap something to hang onto or be repulsed by. But cling wrap also manages to hang on to metal which conducts electricity and so would eliminate a difference in charge in glass, and itself. Some plastic wrap is hydrophilic, grabbing on to any water it gets close to.

Most cling wrap is made of one of two materials; polyvinyl chloride or low-density polyethylene. Both of these are long polymers - chains of molecules. These chains cling to each other very well. In fact, the polymers in polyvinyl chloride are so bound together that they do not let water or air get through them thus conserving the temperature. The military used to spray "Saran," the early name of the chemical, on fighter planes to prevent corrosion. It was also used in upholstery. To make it suitable, companies add plasticizers to make it softer and more malleable.

Studies conducted by the Central Research Institute Of Plastics, Amsterdam (2009) have suggested the wide scale use of plastic or cling wraps in conservation of temperature. Cling wraps have been used on a large scale in maintaining the heat of food stuffs and also preserving the shelf life. From here studies were conducted, that lead to the use of cling wrap in field of Health and Technology.

Today, in the field of medicine to control hypothermia, cling films are widely used in infants. Journal on Newborn and Infant Nursing (2012) in an evidentiary review states that occlusive skin wraps are clear, allowing for easy visualization of the infant and the passage of radiant heat through the blanket to the infant. Along with easy visualization of the infant, stabilization in the delivery room can be accomplished with the occlusive skin wrap in place. In this evidentiary review, three different types of plastics bags/wraps were studied: polyethylene, polyurethane, and polythene. The majority of studies used polyethylene, whereas one study examined the use of a polyurethane wrap and another examined the effects of a polythene wrap. Numerous studies compared the use of a plastic bag to the use of a plastic wrap or cap.

Literature related to Effectiveness of Cling Wrap upon Hypothermia in Newborns

Historically, the first occlusive skin wrap studied was an aluminum coated opaque plastic blanket called the "silver swaddler" in 1968. After this study, in 1971, a clear polyethylene bag was researched. The transparency of these bags made it easier for caregivers to observe and manage the infant with minimal disruption of the wrap. In both studies, researchers found that infants wrapped in plastic were warmer than control subjects due to a reduction in evaporative and radiant heat loss. The rationale for the use of an occlusive skin wrap is to decrease evaporative water and heat loss, as well as decrease convective heat loss immediately after birth, when losses are at their highest. This is accomplished by the creation of a

microenvironment between the infant and the plastic which traps the warm and humidified air under the occlusive wrap and close to the infant's skin.

Extremely premature LBW infants received the most benefit from an occlusive skin wrap as an adjunct to current thermo-protective strategies already used in the delivery room. Admission temperatures in the NICU were higher in preterm infants who were placed in the occlusive skin wrap while wet with amniotic fluid and under radiant heat. Mortality and morbidity were the most common variables analyzed. Carroll found a statistically significant decrease ($P = .04$) in grade 3–4 IVH in infants assigned to the plastic wrap group. Fewer deaths were reported in premature infants that underwent stabilization with occlusive skin wrap, yet none demonstrated a statistically significant improvement of survival with the use of occlusive skin wrap.

A similar randomized controlled trial study was conducted by Parsies (2008) on cling wrap at Maryland Hospital United Kingdom; an innovative intervention for temperature maintenance and reduction of insensible water loss in very low-birth weight babies nursed under radiant warmers. The aim of the study was to assess the value of polythene film (cling wrap) to improve thermal control and reduce postnatal weight loss in normal newborns, preterm and very low-birth weight babies. Consecutively born babies with birth weight between 750 and 1500 g were stratified by birth weight (<1250 g, 1251-1500 g) and randomized either to the cling wrap (CW) or no cling wrap (NCW) group. The baby bassinette of the RW was covered with cling wrap up to the level of the neck in the CW group for the first seven days.

The primary outcome variables were the incidence of hypothermia (axillary temperature < or = 36 C) after initial stabilization during the first 7 days and cumulative weight loss (percentage of birth weight) at 48 hours of age. The results show that of 51 babies, 26 were randomized to the CW and 25 to the NCW group. None of the babies in the CW group developed hypothermia in the 1st 7 days but 36% in the NCW group ($p = 0.001$) did. Babies who were hypothermic on admission

took less time to reach normal temperature in the CW group. Cumulative weight loss in the 1st 48 hours was 5.0 + 5.6% in the CW group and 8.6 + 7.0% in the NCW group ($p = 0.06$).

Aggarwal (2010) conducted a study to assess the value of polythene film (cling wrap) to improve thermal control in newborns and reduce postnatal weight loss in preterm and very low-birth weight babies. Of 65 babies, 32 were randomized to the Cling wrap and 33 to the Non Cling Wrap group. None of the babies in the Cling wrap group developed hypothermia in the 1st 5 days but 30% in the Non Cling wrap group ($p = 0.001$) did.

Researchers at Sunnybrook Health Services Center, in Toronto, Canada (2007) were interested at a novel approach to help prevent babies from hypothermia with use of cling wrap. They are part of the Heat Loss Prevention Trial, which is an international randomized control study that has more than 40 neonatal intensive care units from around the world who are participating. The babies who were chosen to be in the wrapped group were put in an open plastic known as polyethylene occlusive wrap. It was wrapped around the baby on the bassinet, with only the head remaining outside. The care they received was that normal neonatal care and the outcome was found to be convincing with the neonates wrapped with cling wrap showing better extra-uterine adjustments leading to early discharge from the various units.

There has been certain potential threats and complications associated with use of cling wrap and can be discussed; Hyperthermia, defined as >37.0°C (98.6°F)–>37.5°C (99.5°F), was reported in a small number of infants in eight of the eleven studies reviewed. It remains unclear whether these infants were born hyperthermic or whether hyperthermia was iatrogenic and related to the skin wrap. Hyperthermia occurs when the infant is overheated beyond its ability to rid body heat leading to brain protein structural changes and potentially resulting in seizures or death. The addition of a hat/cap can possibly lead to hyperthermia and brain injury by

overheating the cortex and cerebellar regions in conjunction with hypoxia or asphyxia near the time of birth. It is believed that hyperthermia occurring with skin wrap use is related to increased heat output from the radiant heat source due to the inability of skin temperature probe to adhere in the moist microenvironment. Overly aggressive thermo-protection strategies can swing the pendulum from hypothermia to hyperthermia.

Health care providers reported difficulty assessing heart rate and/or breath sounds during stabilization with occlusive skin wrap use. Another study reported displacement of the polyethylene sheet during chest compressions and variability of use among practitioners. Occlusive skin wrap use requires diligent nursing care and frequent temperature assessments to monitor for both hyperthermia and hypothermia. The studies reviewed demonstrate that occlusive skin wraps are effective in keeping LBW premature infants warmer when compared to routine delivery room heat conservation strategies. Occlusive skin wraps are most beneficial for infants <1500 grams and <29 weeks of gestation. Potential complications, such as hyperthermia, are associated with occlusive skin wrap, therefore close monitoring is warranted.

Summary

This chapter has dealt with the review of literature related to the problem stated. The literatures presented here were extracted from Medline, Journal of Pediatrics and Wikipedia. It includes ten primary sources and four secondary sources. It has helped the researcher to understand the impact of the problem under study. It has also enabled the investigator to design the study, develop the tool, plan the data collection procedure and to analyze the data.

CHAPTER III

RESEARCH METHODOLOGY

The methodology of the research study is defined as the way, the data is gathered and analyzed in order to answer the research questions or analyze the research problem. It enables the researcher to project the blue print of the research problem undertaken. The research methodology involves a systematic approach by which the researcher starts from initial identification of the problem to find its final conclusion (Polit and Beck,2008).

The present study was conducted to assess the effectiveness of cling wrap upon hypothermia in newborns. This chapter deals with a brief description of different steps undertaken by the researcher for the study. It involves research approach, research design, the setting, population, the sample and sampling technique, selection of the tool, content validity, reliability, pilot study, protection of human rights, data collection procedure and plan for data analysis.

Research Approach

Research approach is the most significant part of any research. The appropriate choice of the research approach depends on the purpose of the research study which is undertaken. According to Polit and Beck (2008), an Experimental research is an extremely applied form of research and involves finding out the efficiency of any programme and the practice of policies. Its goal is to assess or evaluate the success of the programme. In this study, the researcher assessed the effectiveness of cling warp usage on preventing hypothermia in newborns by using experimental research design.

Research Design

The overall plan for addressing a research question, including specifications for enhancing study's integrity is called a research design. A research design incorporates the most important methodological design that a researcher works on conducting a research study (Polit and Beck, 2008).

A true experimental design was adopted for conducting this study. The intervention was carried out for a span of 3 days and over a period of 24 hours per day.

O1 - O2 O3 O4 O5

O1 X O2 O3 O4 O5

01 - Pretest.

02 - Post test.

X - Implementation of cling wrap.

Variables

Variable is an attribute that varies, and takes on different values (Polit, 2010).

Independent variable

The variable that is believed to cause or influence the dependent variable is called independent variable (Polit and Beck,2008). In this study, the independent variable was cling wrap used for newborns.

Dependent variable

The variable hypothesized to depend on or be caused by another variable is the dependent variable (Polit and Beck,2008). In this study hypothermia was considered as dependent variable.

Attribute variable

Variables that describe the study sample characteristics are termed as attribute variables (Polit and Beck,2008) In this study the attribute variables were neonatal variables gestational age, birth weight, gender, APGAR.

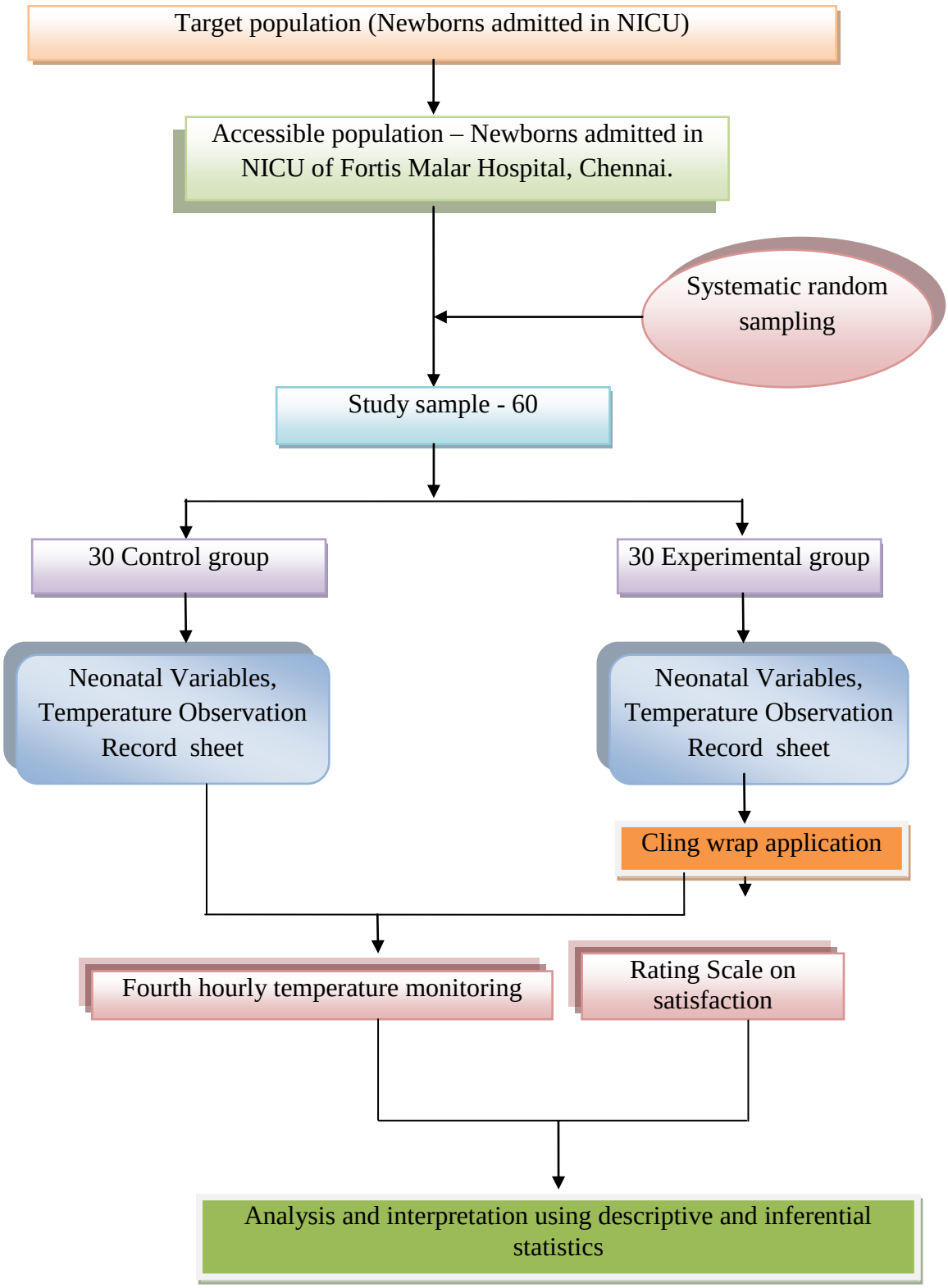

Fig. 2. Schematic Representation of the Research Methodology

Research Setting

Settings are the most specific places where data collection will occur (Polit and Beck, 2008).The present study was conducted in Fortis Malar Hospital. It is a 400 bed multispeciality hospital located at Adyar in Chennai. They have facilities that include Emergency care unit, Cardio Thoracic Intensive Care(CTICU), Medical and Surgical Intensive care units, Dialysis Unit and Neonatal Intensive Care Unit(NICU). It is a pioneering center for Neurosurgery in the city. The researcher collected data from NICU which is located on the second floor with restricted entry and exit. The NICU has total of 15 beds with 7 step-down and 8 step-up units. The neonatal team is well equipped with personnel and advanced care equipments.

Population

Population is the entire aggregation of cases which meet designated set of criteria (Polit and Beck 2008).

Target population is the group of population that the researcher aims to study and to whom the study findings will be generalized. In this study, the target population comprises of all the newborns in NICU.

Accessible population is the list of population that the researcher finds in the study area. The accessible population in this study was all the newborns in NICU of the selected hospital who satisfied the inclusion criteria.

Sample

Sample consists of the subset of the units that comprises the population (Polit and Beck 2008). A sample size of 60 newborns who meet the inclusion criteria were chosen for this study, of which 30 were assigned to control group and 30 were assigned to experimental group.

Sampling Technique

Sampling is the process of selecting a portion of population to represent the entire population. (Polit and Beck,2008).The subjects of this study were selected by systematic random sampling. 30 were assigned to control group and 30 were assigned to experimental group.

Sampling Criteria

Inclusion criteria

- All newborns within 28 days of life
- Newborns admitted in NICU.
- Hemodynamically stable newborns

Exclusion criteria

- Newborns with congenital defects.
- Newborns who had undergone surgery.
- Newborns who were critically ill.

Selection and Development of the Study Instruments

As the study is aimed at evaluating the effectiveness of cling wrap upon hypothermia in newborns in NICU, the data collection instruments were developed through an extensive review of literature in consultation with experts and with the opinion of faculty members. The instruments used in this study were; Neonatal variable profoma, Temperature observation record sheet and Caregiver's satisfaction rating scale.

Neonatal variable proforma

This consists of information regarding newborn such as gestational age in weeks, birth weight, gender, APGAR.

Temperature observation record sheet

This consists of information regarding various temperature readings of the newborns every fourth hourly over a period of 24 hours for a span of 3 days.

Caregiver's satisfaction rating scale

A five point rating scale was developed and consists of 10 questions. It is self administered and not standardized. It consists of 10 statements related to the approach of researcher and practice of cling wrap. The total score is 50.

Score	Percentage	Interpretation
<15	30%	Satisfied
15-35	>30-70%	Moderately satisfied
>35	>70%	Highly satisfied

Psychometric Properties

Validity of study instruments

Content validity refers to the adequacy of the sampling of the domain being studied. The content validity of the tool was obtained by getting opinion from seven experts. The validation has suggested some specific modifications in the neonatal variable proforma and satisfaction rating scale. The modifications and suggestions of experts were incorporated in the final preparation of the tool.

Reliability of study instruments

Reliability refers to the accuracy and consistency of measuring tool. The reliability of the tools was determined by using test-retest method and split half method. The reliability score of the neonatal variable proforma was 0.32 and the rating scale was 0.96 which represented the positive correlation. They showed that the tools were highly reliable.

Pilot Study

According to Polit and Beck(2008), a pilot study is a miniature of some part of the actual study, in which the instrument is administered to the subjects drawn from the population. It is a small scale version or trial run, done in preparation for the major study. The purpose is to find out the feasibility to conduct the main study.

Pilot study was conducted with six newborns who were admitted in NICU of Fortis Malar Hospital, Chennai. The cling wrap administered was found to be feasible.

Protection of Human Rights

- The study was conducted after the approval of the ethical committee, Apollo Hospitals, Chennai.
- Obtained permission from Principal, Apollo College of Nursing, HOD of Paediatric Nursing Department and Medical Superintendent of Fortis Malar Hospital where the study was conducted.
- The parents of participants were explained about the study and written consent was obtained after providing assurance and developing confidence.
- Confidentiality of the data was maintained throughout the study.

Data Collection Procedure

Data collection is the precise, systematic gathering of information relevant to the research purpose. The researcher presented the proposal to the ethical committee of Apollo Hospitals and got ethical clearance to proceed the study. The investigator collected the data from Fortis Malar Hospital after obtaining proper administrative permission from the concerned authorities. The study participants were selected using systematic random sampling of which 30 were assigned to control group and 30 were assigned to experimental group.

The pretest temperature was recorded for both the control and experimental group of newborns. Cling wrap was administered to the experimental group of newborns from lower two –third end of the bassinet covering the newborn from below the neck till the foot end. Subsequent post test temperature readings were recorded every fourth hourly for the newborns over a span of 3 consecutive days. The cling wrap was changed once in every six hours or as and when required or soiled.

At the end of the third day, the rating scale was used to assess the caregiver's level of satisfaction .The data collection period was from June to July 2012.

Problems Faced During Data Collection

The problems faced during the process of this study were,

- Some newborns were discharged by end of two days. Instead other sample were to be chosen.
- Lack of interest of caregivers to fill the satisfaction checklist.

Plan for Data Analysis

Data analysis is the systematic organization and synthesis of research data and testing of null hypotheses by using the obtained data (Polit and Beck,2008).Data analysis and interpretation were carried out using descriptive and inferential statistics like mean, standard deviation, paired 't'test and chi square.

Summary

This chapter dealt with the selection of research approach, research design, setting, population, sample and sampling technique, sampling criteria, selection and development of study instruments, validity and reliability of study instruments, pilot study, data collection procedure and plan for data analysis.

CHAPTER – IV

ANALYSIS AND INTERPRETATION

Data analysis is conducted to reduce, organize and give meaning to the data. The results obtained from data analysis require interpretation to be meaningful. Interpretation of data involves examining the results from data analysis forming conclusions, considering the implications for nursing, exploring the significance of the findings and suggesting further studies (Burns and Groove,2007).

This chapter deals with analysis and interpretation of data including both descriptive and inferential statistics. Statistics refers to the analysis and interpretation of data with a view toward objective evaluation of the reliability of the conclusions based on the data (Jerold,2004). The data were analyzed according to the objectives and hypothesis of the study. Analysis of the data was compiled after all the data was transferred to the master coding sheet. The data were analyzed, tabulated and interpreted using appropriate descriptive and inferential statistics.

Organization of the Findings

The findings of the study were organized and presented under the following headings.

- Frequency and percentage distribution of neonatal variables in the control and experimental group of newborns
- Frequency and percentage distribution of pretest and post test level of hypothermia in control group of newborns
- Frequency and percentage distribution of pretest and post test level of hypothermia in experimental group of newborns
- Comparison of mean and standard deviation of pretest and post test level of hypothermia in control and experimental group of newborns.

- Level of satisfaction of caregivers, in use of cling wrap in experimental group of newborns.
- Association between neonatal variables and pretest level of hypothermia in control group of newborns.
- Association between neonatal variables and posttest level of hypothermia in control group of newborns.
- Association between neonatal variables and pretest level of hypothermia in experimental group of newborns.
- Association between neonatal variables and posttest level of hypothermia in experimental group of newborns.

Table 1. Frequency and Percentage Distribution of Neonatal variables in the Control and Experimental Group of Newborns

Neonatal Variables	Control Group (n = 30)		Experimental Group (n = 30)	
	n	p	n	p
Gestational Age in weeks				
30 – 33	6	20	4	13.4
34 – 37	10	33.3	16	53.3
38 – 40	14	46.7	10	33.3
Gender				
Male	15	50	17	56.7
Female	15	50	13	43.3
APGAR at 10^{th} minute				
< 3	2	6.7	1	3.3
4 – 7	9	30	5	16.7
8 – 10	19	63.3	24	80

The data from Table 1 infers that majority of newborns had gestational age of 34-40 weeks (46.7%,53.3%), were males(50, 56.7%) , with an APGAR between 8-10 (63.3%,80%) in control and experimental group respectively

Fig 3 shows that majority of the newborns of both control and experimental group, had birth weight of 2.5-3.5 kg (50%, 66.7%) respectively.

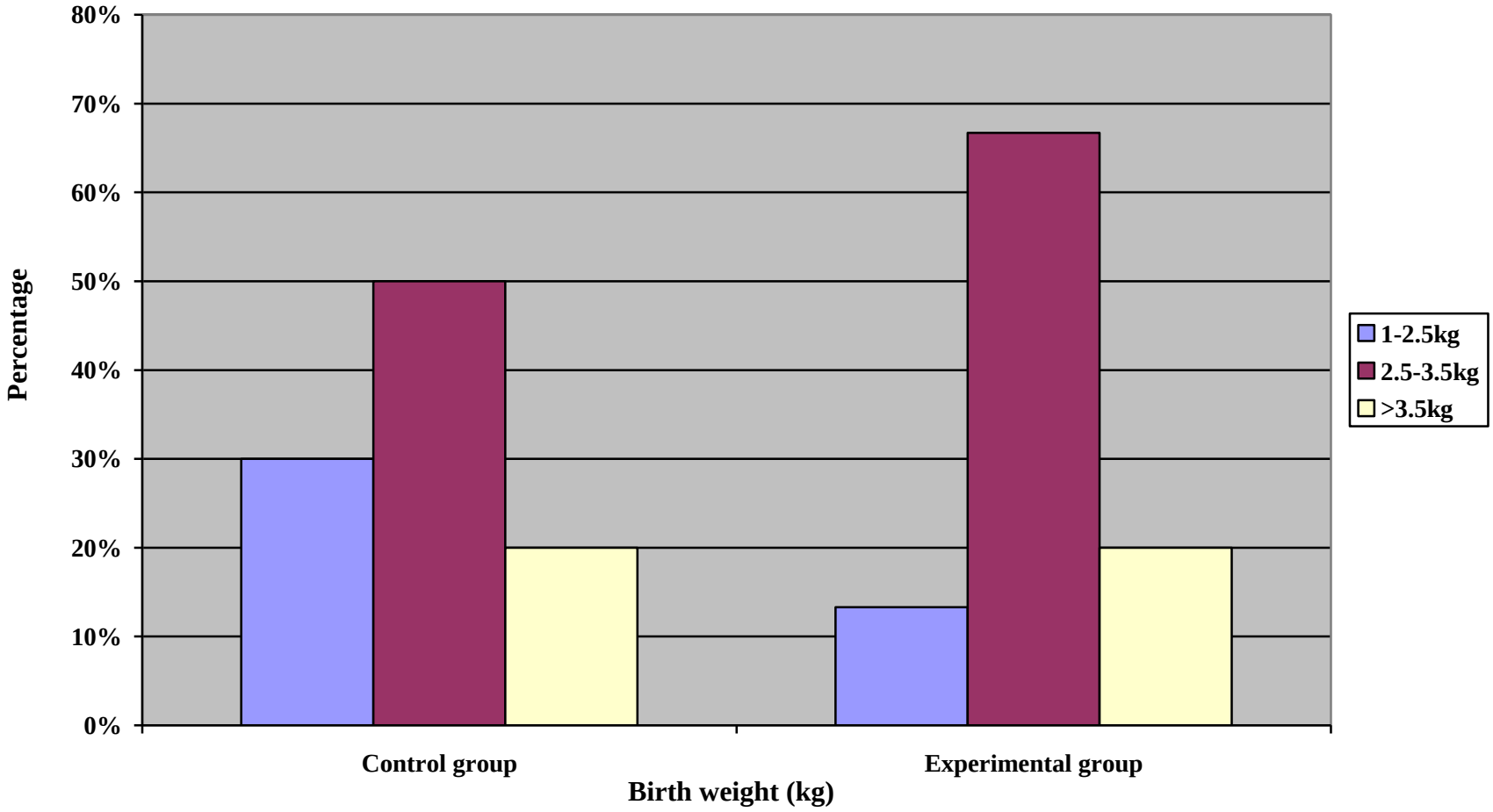

Fig .3 Percentage Distribution of Birth Weight in Control and Experimental of Newborns

Table 2. Frequency and Percentage Distribution of Pretest and Post test Level of Hypothermia in Control Group of Newborns

Level of Hypothermia	Pre test (n = 30)		Post test (n = 30)	
	n	p	n	p
No Hypothermia	6	20	7	23.3
Moderate Hypothermia	15	50	21	70
Severe Hypothermia	9	30	2	6.7

The data from Table 2 suggests that majority of the newborns in the control group had moderate hypothermia (50%, 70%) in the pretest and post test respectively

Table 3. Frequency and Percentage Distribution of Pretest and Post test Level of Hypothermia in Experimental Group of Newborns

Level of Hypothermia	Pre test (n = 30)		Post test (n = 30)	
	n	p	n	p
No Hypothermia	0	0	30	100
Moderate Hypothermia	26	86.7	0	0
Severe Hypothermia	4	13.3	0	0

The data from table 3 denotes that most of the newborns (86.7%) had moderate hypothermia before use of cling wrap whereas none of them had hypothermia, after use of cling wrap in experimental of newborns.

Table 4. Comparison of Mean and Standard Deviation Of Pre test and Post test Level of Hypothermia in Control and Experimental Group of Newborns

No.	Control group n=30		Experimental group n=30		't' value
	Mean	SD	Mean	SD	
Pre-test	33.847	1.974	33.840	1.536	1.3
Post-test	34.262	1.638	36.597	0.145	18.6***

(p<0.001)

The data in Table 4 shows that the difference in mean and standard deviation of the level of hypothermia before the use of cling wrap(M=33.84,33.84 & SD=1.97, 1.53) between the control and experimental groups is not statistically significant (p<0.001), whereas after the use of cling wrap, there is a difference in the mean and standard deviation of the level of hypothermia (M=34.26,36.59 & SD=1.63, 0.145) between the control and experimental groups of newborns..

Fig 4 shows that majority of the care givers were highly satisfied (87%) with application of cling wrap and none of them were dissatisfied with the intervention.

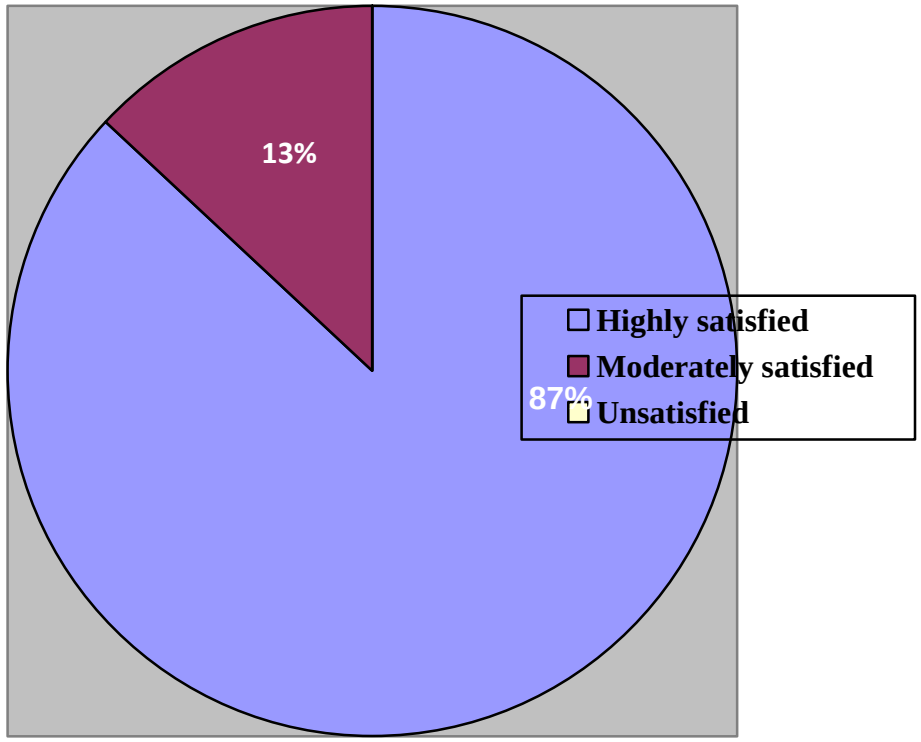

Fig.4 Level of Satisfaction of Caregivers, in use of Cling Wrap in Experimental Group of Newborns

Table 5. Association between Neonatal variables and Pretest Level of Hypothermia in Control Group of Newborns

Neonatal Variables	No Hypothermia	Moderate Hypothermia	Severe Hypothermia	df	χ^2
Gestational Age(wks)					
30 – 33	1	0	5	4	12.94
34 – 37	1	6	3		
38 – 40	4	9	1		
BirthWeight (Kg)					
1 – 2.5	1	2	6	4	8.522
2.5-3.5	4	9	2		
> 3.5	1	4	1		
Gender					
Male	4	5	6	2	3.333
Female	2	10	3		
APGAR (10^{th} min)					
< 3	1	0	1	4	17.748
4 – 7	**0**	**2**	**7**		
8 – 10	**5**	**13**	**1**		

The data in Table 5 reveals that there is significant association between neonatal variables (gestational age, APGAR) and pretest level of hypothermia in control group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR ($p<0.05$, $p<0.01$).

Table 6. Association between Neonatal Variables and Posttest Level of Hypothermia in Control Group of Newborns

Neonatal Variables	No Hypothermia	Moderate Hypothermia	Severe Hypothermia	df	χ^2
Gestational Age (weeks)					
30 – 33	1	4	1	4	**4.014**
34 – 37	1	8	1		
38 – 40	5	9	0		
Birth Weight (Kg)					
1 – 2.5	2	6	1	4	2.405
2.5-3.5	4	11	0		
> 3.5	1	4	1		
Gender					
Male	5	8	2	2	4.476
Female	2	13	0		
APGAR (10th min)					
< 3	1	0	1	4	**12.29**
4 – 7	0	8	1		
8 – 10	6	13	0		

Table 6 shows that there is significant association between neonatal variables (gestational age and APGAR) in posttest level of hypothermia in control group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR ($p<0.05$, $p<0.01$).

Table 7. Association between Neonatal Variables and Pretest Level of Hypothermia in Experimental Group of Newborns

Neonatal Variables	No Hypothermia	Moderate Hypothermia	Severe Hypothermia	df	χ^2
Gestational Age (weeks)					
30 – 33	0	1	3	2	**15.397**
34 – 37	0	15	1		
38 – 40	0	10	0		
Birth Weight(Kg)					
1 – 2.5	0	2	2	2	5.769
2 -3.5	0	18	2		
> 3.5	0	6	0		
Gender					
Male	0	14	3	1	0.632
Female	0	12	1		
APGAR (10th min)					
< 3	0	1	0	2	**23.077**
4 – 7	0	1	4		
8 – 10	0	24	0		

Table 7 signifies that there is significant association between neonatal variables (Gestational age, APGAR) in pretest level of hypothermia in experimental group of newborns. So null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR ($p<0.05$, $p<0.01$).

Table 8. Association between Neonatal variables and Posttest level of hypothermia in experimental group of newborns.

Neonatal Variables	No Hypothermia	Moderate Hypothermia	Severe Hypothermia	df	χ^2
Gestational Age(weeks)					
30 – 33	4	0	0	*	*
34 – 37	16	0	0		
38 – 40	10	0	0		
Birth Weight (Kg)					
1 – 2.5	4	0	0	*	*
2 – 3.5	20	0	0		
> 3.5	6	0	0		
Gender					
Male	17	0	0	*	*
Female	13	0	0		
APGAR (10th min)					
< 3	1	0	0	*	*
4 – 7	5	0	0		
8 – 10	24	0	0		

* No statistics are computed because Post_Rec is a constant

Table 8 shows that there is no significant association at $p<0.001$ between neonatal variables and posttest level of hypothermia in experimental group of newborns.

Summary

This chapter dealt with analysis and interpretation of the data obtained by researcher. The analysis showed that there was no hypothermia in experimental group of newborns after use of cling wrap and there was found to be high level of satisfaction among care givers with use of cling wrap.

CHAPTER V

DISCUSSION

An Experimental Study to Assess the Effectiveness of Cling Wrap upon Hypothermia in Newborns in Neonatal Intensive Care Unit at Selected Hospitals, Chennai.

Objectives of the Study

1. To assess the level of hypothermia before and after use of cling wrap in control and experimental group of newborns.
2. To determine the effectiveness of cling wrap, by comparing the level of hypothermia, before and after the use of cling wrap in control and experimental group of newborns.
3. To determine the care givers level of satisfaction, regarding use of cling wrap in experimental group of newborns.
4. To find out the association between selected neonatal variables and the level of hypothermia before and after the use of cling wrap in control and experimental group of newborns.

An experimental design was adopted for this study. Systematic random sampling technique was used select 30 in control group and 30 in experimental group from Fortis Malar Hospital, Chennai. Neonatal variable proforma, temperature observation record sheet and caregiver's level of satisfaction rating scale were the tools used to collect data, after establishing validity and reliability. The main data collection was done after determining the feasibility and practicability through pilot study.

The level of hypothermia was checked for both control and experimental group before and after the use of cling wrap. The care givers level of satisfaction regarding use of cling wrap was assessed in the experimental group. The data was tabulated and analyzed by using descriptive and inferential statistics.

Neonatal variables of neonates

Among the newborns of both control and experimental group, majority of them had birth weight of 2.5-3.5 kg (50%, 66.7%) respectively. A study conducted by Mac et al (2006) says that the prevalence of hypothermia is threatening in newborns irrespective of gestational age and birth weight is also proportional; at the same time impose higher risk to newborns with undesirable birth weight. Hence it is the responsibility of nurses to give special care in controlling hypothermia among newborns with unfavorable birth weight.

Significant percentage of newborns in NICU belonged to gestational age of 34-40 weeks (46.7%, 53.3%) in control and experimental group respectively. According to the report of Newborn Hypothermia, in Southern Nepal Hospital by Mullany Lc (2009), newborns in first 48 hours of life irrespective of gestational age, experience hypothermia. This report suggests the nurses to concentrate more on newborns in controlling hypothermia.

Majority of newborns of both control and experimental group had good APGAR of 8-10(63.3%, 80%) respectively. Newborns battle to maintain thermoregulation irrespective of gestational age and APGAR. Hence nurses need to attend with vigilance in controlling hypothermia among newborns irrespective of good APGAR score.

The first objective of the study was to assess the level of hypothermia before and after use of cling wrap in control and experimental group of newborns.

Majority of the newborns in the control group had moderate hypothermia (50%, 70%) in the pretest and post test respectively whereas most of the newborns (86.7%) had moderate hypothermia before use of cling wrap and none of them had hypothermia, after use of cling wrap in experimental of newborns. These findings can be substantiated with a study conducted by Aggarwal(2010) to improve thermal control in newborns and reduce postnatal weight loss in preterm and very low-birth weight babies. Of 65 babies, 32 were randomized to the Cling wrap and 33 to the Non Cling Wrap group. None of the babies in the Cling wrap group developed hypothermia in the 1st 5 days but 30% in the Non Cling wrap group ($p = 0.001$) did.

The second objective of the study was to determine the effectiveness of cling wrap, by comparing the level of hypothermia, before and after the use of cling wrap in control and experimental group of newborns.

Majority of newborns in the experimental group had moderate hypothermia (86.7%) before use of cling wrap whereas after the use of cling wrap there was no hypothermia in the experimental group (100%).

Kaushal (2010) conducted a study to assess the value of polythene film ('cling wrap') to improve thermal control in newborns and reduce postnatal weight loss in preterm, very low-birth weight babies was investigated. Of 65 babies, 32 were randomized to the Cling wrap and 33 to the Non Cling Wrap group. None of the babies in the Cling wrap group developed hypothermia in the 1st 5 days but 30% in the Non Cling wrap group ($p = 0.001$) did.

The results from the present study gives a clear picture that, cling wrap prevents heat loss by conduction and convection. So temperature is maintained which in turn stabilizes the newborn. As a result of the stable temperature, the newborn is able to conserve a lot of energy which makes the newborn comfortable. Thus Cling wrap serves as a means of conserver of heat and energy improving the well being of the newborn.

While assessing the temperature of newborns in control group, the post scores had no variations in comparison with pre scores. Whereas in the experimental group, the level of hypothermia after use of cling wrap was low (M=36.59,SD=0.145) in comparison to the level of hypothermia before the use of cling wrap (M=33.84,SD=1.53) suggestive of the effectiveness of use of cling wrap. The findings are also consistent with the findings of Keba and associates (2010) among neonates in western Philippines. Of 50 newborns 25 were randomized to cling wrap and other 25 were not under cover of cling wrap. All the newborns under the cover of cling wrap maintained positive thermal balance as well as improved physiological parameters.

Resources from WHO manual (2011) reveal that in hospitals with the practice of cling wrap, neonatal mortality has dipped from 20% to 12%. From these findings we infer that, employing the practice of cling wrap is a cost effective method in thermoregulation in early neonatal period thereby reducing the risk of mortality.

The third objective of the study is to determine caregivers' level of satisfaction, regarding use of cling wrap in experimental group of newborns.

The study findings revealed that, majority of the caregivers were highly satisfied (87%) with use of cling wrap and none of them had dissatisfaction towards the intervention. This interprets that use of cling wrap was highly effective in controlling hypothermia among newborns. The researcher also identified use of

cling wrap as an easy, cost effective measure that requires minimal effort to practice. The results have shown positive impact over the goal and thus can be welcomed at any primary and tertiary care setting. Researchers at Sunnybrook Health Services Center, in Toronto, Canada, (2007) were interested at a novel approach to help prevent babies from hypothermia with use of cling wrap. The outcome was found to be convincing with the neonates wrapped with cling wrap showing better extra-uterine adjustments leading to early discharge from the various units.

Though there are many ways to reduce the level of hypothermia, use of cling wrap in clinical settings has shown better effects. Thus the pediatric nurses should understand its importance and should be encouraged in practicing such methods.

The fourth objective of the study was to find out the association between selected neonatal variables and level of hypothermia before and after the use of cling wrap in control and experimental group of newborns.

It was observed in the present study that significant percentage of newborns in NICU belonged had gestational age of 34-40 weeks (46.7%, 53.3%), were males (50, 56.7%), with an APGAR between 8-10 (63.3%,80%), and birth weight of 2.5-3.5 kg (50%, 66.7%), in control and experimental group respectively. This implies that besides major health issues in newborns, minor ailments necessitates NICU admission. Hence this warrants the nurses to focus on care aspects that would accelerate early recovery and discharge. Thus when efficient immediate neonatal care is strengthened in all spheres, we can limit mortality and morbidity among neonates.

There was significant association between neonatal variables such as gestational age (χ^2=12.94,15.39, df=2) ($p<0.05$), APGAR (χ^2=17.74,23.07, df=2) ($p<0.01$) and pretest level of hypothermia in control and experimental group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR.

It was also observed that there was significant association between neonatal variables such as gestational age (χ^2=4.04, df=2) ($p<0.05$), APGAR (χ^2=12.9, df=2) ($p<0.01$) and posttest level of hypothermia in control group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR. Whereas there was no association between neonatal variables and posttest level of hypothermia in experimental group of newborns.

This emphasizes that neonatal variables have some influence over the level of hypothermia among newborns and necessitates provision of external agent in controlling the level of hypothermia among newborns in NICU.

Summary

This chapter has dealt with the discussion of various aspects of the study findings, this emphasized on the objectives of the study, major findings of the neonatal variables, comparison of level of hypothermia before and after use of cling wrap in control and experimental group, association between selected neonatal variables and level of hypothermia in both groups and the caregiver's level of satisfaction regarding use of cling wrap in experimental group of newborns in NICU with the help of extensive review of literature.

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATIONS & RECOMMENDATIONS

The heart of the research project is in writing & reporting the findings. This is the most creative and demanding part of the study. This chapter gives a brief account of the present study including the conclusion drawn from the findings, nursing implications of the study and recommendations.

Summary

An Experimental Study to Assess the Effectiveness of Cling Wrap upon Hypothermia in Newborns in Neonatal Intensive Care Unit at Selected Hospitals, Chennai.

Objectives of the Study

1. To assess the level of hypothermia before and after use of cling wrap in control and experimental group of newborns.
2. To determine the effectiveness of cling wrap, by comparing the level of hypothermia, before and after the use of cling wrap in control and experimental group of newborns.
3. To determine the care givers level of satisfaction, regarding use of cling wrap in experimental group of newborns.
4. To find out the association between selected neonatal variables and the level of hypothermia before and after the use of cling wrap in control and experimental group of newborns.

Null Hypotheses

Ho_1 There will be no significant difference in the level of hypothermia, before and after use of cling wrap in the control and experimental group of newborns.

Ho_2 There will be no significant association between selected neonatal variables and level of hypothermia, before and after use of cling wrap in the control and experimental group of newborns.

The conceptual framework in this study was developed on the basis of Callista Roy's Adaptation theory which was modified for the present study. An extensive review of literature and experts guidance laid the foundation to the development of tools such as neonatal variables profoma, temperature observation recording sheet and on the caregivers level of satisfaction rating scale on use of cling wrap.

A true experimental design was used for conducting the study. The present study was conducted in NICU of Fortis Malar Hospital, Adyar, Chennai. The sample size for the present study was 60, 30 in control group and 30 in experimental group who satisfied the inclusion criteria were chosen for this study.

The investigator used the neonatal variables to obtain the baseline data and rating scale to assess the level of caregiver's satisfaction. The data collection tools were validated and the reliability was established. After the pilot study, the data for the main study was conducted for 6 weeks. The collected data was tabulated and analyzed by using appropriate descriptive and inferential statistics.

Major Findings of the Study

Neonatal variables

Majority of newborns had gestational age of 34-40 weeks (46.7%,53.3%), were males(50, 56.7%) , with an APGAR between 8-10 (63.3%,80%), and birth weight of 2.5-3.5 kg (50%, 66.7%), in control and experimental group respectively.

Frequency and percentage distribution of level of hypothermia in the control and experimental group of newborns before and after use of cling wrap.

Majority of newborns in the experimental group had moderate hypothermia (86.7%) before use of cling wrap whereas after the use of cling wrap there was no hypothermia in the experimental group (100%). Therefore it is attributed to the effectiveness of cling wrap.

Comparison of mean and standard deviation of pre test and post test level of hypothermia in control and experimental group of newborns.

The difference in mean and standard deviation of the level of hypothermia before the use of cling wrap (M=33.84, 33.84 & SD=1.97, 1.53) between the control and experimental groups is not statistically significant ($p<0.001$), whereas after the use of cling wrap, there is a difference in the mean and standard deviation of the level of hypothermia (M=34.26, 36.59 & SD=1.63, 0.145) between the control and experimental group of newborns. So the null hypothesis Ho_1 was rejected.

Frequency and percentage of level of satisfaction of caregivers, regarding use of cling wrap in experimental group of newborns.

Majority of the caregivers were highly satisfied (87%) with use of cling wrap and (13%) were moderately satisfied. None of them were unsatisfied towards the

intervention. This interprets that use of cling wrap was highly effective in controlling hypothermia among newborns.

Association between selected neonatal variables and level of hypothermia in control and experimental group of newborns before and after use of cling wrap

There was significant association between neonatal variables such as gestational age (χ^2=12.94,15.39, df=2) ($p<0.05$), APGAR (χ^2=17.74,23.07, df=2) ($p<0.01$) and pretest level of hypothermia in control and experimental group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR.

It was also observed that there was significant association between neonatal variables such as gestational age (χ^2=4.04, df=2) ($p<0.05$), APGAR (χ^2=12.9, df=2) ($p<0.01$) and posttest level of hypothermia in control group of newborns. So the null hypothesis Ho_2 is partially rejected with regard to gestational age and APGAR. Whereas there was no association between neonatal variables and posttest level of hypothermia in experimental group of newborns.

Conclusion

Cling wrap is proposed as a means to maintain thermoregulation in a cost effective manner. The findings of the study indicate that cling wrap will effectively improve thermoregulation of the newborns thereby preventing complications of hypothermia as well as improving caregivers' level of satisfaction.

Implications

The findings of the study has implications in different branches of nursing profession that is nursing practice, nursing education, nursing administration and nursing research. By assessing the effectiveness of cling wrap upon hypothermia we get clear pictures regarding different steps to be taken in all these fields to improve the standards of nursing profession.

Nursing practice

Nurses have a major role in reducing the mortality and morbidity of newborns requiring intensive care. Pediatric clinical practice nurses have favourable offer to educate nurses and mothers regarding enhancement of thermoregulation in newborns. The study findings also show that the caregivers were highly satisfied with use of cling wrap in controlling hypothermia as it has clinical benefits. This shows that the health care provider plays a vital role in educating and implementing cling wrap measures for notable outcomes.

Nursing education

With emerging health care trends, nurses should also know about the newer emerging economical concepts of achieving thermoregulation in newborns. This helps the clinical nurse to use cling wrap as a holistic approach of improving thermoregulation. Nurses need evidence based practice in managing the newborns with thermal imbalance.

Nurse educators when planning for instructing nursing students should provide opportunities for students to gain the knowledge in techniques of improving thermoregulation. The study outlines the significance of short term courses and in service education to equip the nurses with current knowledge in different kinds of thermoregulation methods and its benefits. Nurse educator should check out suitable programme to educate the mothers and nurses on the importance of thermoregulation to promote the quality of life of newborns. The research findings will serve as a guide for evidence based practice.

Nursing administration

With ever growing challenges of health care needs, the administrators have a responsibility to provide nurses with substantive continuing education opportunities. Nurse administrators should conduct periodical review meetings to evaluate the quality of newborn care.

With advanced technology and over growing challenges of health care needs, the colleges and hospital administrators, have a responsibility to provide nurses, nurse educators with continuing opportunities on newer economical trends in thermoregulation like cling wrap and its benefits, health promoting properties and its availability. This will enable the nurses to update their knowledge and acquire special skills in the preparation and use of adequate and healthy ways of improving thermal balance. Nurse administrators should take adequate steps with the growing bodies in formulating policies and protocol to emphasize on nursing care, and plan for man, power, money, material methods and time to conduct the programmes that upgrade their knowledge on newer practices. Nurse administrators should provide opportunities for the nurses and midwives to attend the training programme.

Nursing research

There is a need for extensive research in this area to generate more specific data base and to identify the benefits of such modalities and provide much needed information for the consumers and providers.. It opens a big avenue for innovative methods of creating awareness, development of teaching material and setting up multimedia among the health care providers regarding thermoregulation, its benefits, health promoting properties and its availability. We should encourage further researcher on effectiveness of cling wrap with various population. Dissemination of findings to wider communities through conferences, seminars, publications, national and international journals and World Wide Web will greatly benefit them.

Nursing theory

The conceptual and theoretical models exclusively for the use of improving thermal balance are yet to be developed by the nursing theorist. This present study is based on modified Callista Roy’s adaptation theory, which can be used to educate and guide the nurses in caring for the newborns with thermal imbalances.

Recommendations

- Future study with larger sample size and a matched control will help in reducing the bias.
- A similar study can be conducted in other settings such as community centres and peripheral hospitals.
- A study involving newborns less than 30 weeks will be useful to standardize medical practice in developing countries.
- A comparative study can be conducted on effectiveness of cling wrap with other thermoregulation therapies upon thermal balances.
- A study can be conducted to assess the level of knowledge among nurses regarding thermal balance.

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